

REMARKS

The above-identified patent application has been amended and reconsideration and reexamination are hereby requested. This is a timely reply to the Official Action of April 25, 2002. The Examiner rejects all pending claims of the application. The grounds for rejection are traversed below. New Claims 18-19 have been added to the application.

New Claims

New claims 18 and 19 have been added. Support for new claims 18 and 19 can be found on page 5 line 18 through page 7 line 20 of the present application as filed.

Claims 1-8 and 10-17 remain in the application. New claims 18 and 19 have been added. The application now comprises of 6 (six) independent claims and 18 (eighteen) total claims. The original application comprised 5 (five) independent claims and 16 (sixteen) total claims. The additional excess claims fees have been calculated as shown in the enclosed Excess Claim Fee paper.

Claims Rejections under 35 U.S.C. § 103 based on Blackledge and Kugue

Claim 1

In the Office Action, the Examiner rejects the claims of the application under 35 U.S.C. 103 as being unpatentable over Blackledge et al. (U.S. Pat. No. 5,835,738) in view of Garbus et al. (5,884,027 and/or Kugue (U.S. Pat. No. 5,911,042). Specifically the Examiner asserts that Blackledge teaches all of the elements claimed in claim 1, except the bi-directional address remapping function which is claimed in claim 1 as "the address remapper remapping a dummy address from one section into a physical address to the other section." The Examiner further asserts that one of ordinary skill in the art would have found that the address translation of

Blackledge must work bi-directionally because the communication of one device to another device across the bridges, which includes an address, control information and the data must work in either direction. Further, the Examiner asserts that Garbus and Kugue disclose such a bi-directional address translation. The Examiner then concludes that it would have been obvious to modify Blackledge with the teachings of Garbus and/or Kugue in order to identify one device from another device across the bridge.

As thoroughly discussed in Applicant's Response to Final Rejection dated April 11, 2002, Figure 2 of Blackledge is undeniably a one way address remapper given the fact that the address comparator and range filter 52 only samples one bus, namely PCI bus 56. In a similar vein, in Figure 2, the translator 54, only translates addresses from bus 56 to new addresses on bus 58. For brevity, the additional points made in the April 11, 2002 Response, will not be repeated, however, the Applicant continues to assert those arguments.

Further, the Examiner asserts that one skilled in the art would have found that address translation of Blackledge must work bi-directionally. The Applicant respectfully disagrees. As stated in Blackledge col. 3, lines 3-5, "there are two types of entities in a system that emit address and control signals to the busses: (1) System master; (2) Bus masters and third party DMA controllers". Thus, Blackledge teaches that the devices responding to the system masters or the bus masters do not emit address and thus do not require address translation. One must conclude that one skilled in the art would not have found that address translation of Blackledge must work bi-directionally. Therefore, Blackledge does not teach, disclose or suggest, either alone or in combination with the knowledge that the devices are communicating across a bridge, an "address remapper remapping a dummy address from one section into a physical address to the other section", as is claimed in claim 1.

In addition, Blackledge teaches in col. 5, lines 47-52 that the address comparator/range filter filters out addresses not corresponding to the subordinate devices. The translator then preforms the required translation. Thus, the system of Blackledge decides when to perform address

translation. This limitation is not found in the present invention. Claim 1 claims, "the address remapper remapping a dummy address from one section into a physical address to the other section." It would be impossible to negatively claim everything that the present invention did not do. Thus, the address translator of Blackledge is not the address remapper claimed in the present invention.

As noted by MPEP 2143.03, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. The Applicant respectfully asserts that the combination of Blackledge with Kugue does not teach all of the claim limitations of claim 1. Specifically the Applicant asserts that the combination of Blackledge with Kugue does not teach, describe or suggest "each station on each section of the bus are assigned a dummy address for being addressed by a station on the other section, the address remapper remapping a dummy address from one section into a physical address to the other section", as is claimed in claim 1.

Kugue teaches a computer system enabling access lock of a storage device to be released when a portable computer and an expansion unit are hotly docked and thus permitting the storage device to be added as a resource, see col. 2, lines 20-24 of Kugue. The Examiner points to col. 6, lines 10-14 of Kugue as teaching bi-directional address translation. Col. 6, lines 10-14 state "The host-PCI bridge unit 12 has a function for, in a bi-direction manner, converting bus cycles including data and addresses between the processor bus 1 and the internal PCI bus 2". The Applicant is unaware of where else in Kugue that the concept of converting bus cycles including data and addresses is mentioned. Thus, it is unclear from the wording of Kugue what converting means. In fact, in col. 6, lines 22 - 26 of Kugue state that the data transfer cycle on the internal PCI bus 2 is composed of address phases and one or more data phases following the address phase. In the address phase, the address and the type of transference are output, while 8-bit, 16-bit, 24-bit or 32-bit data is output in the data phase. Thus, one skilled in the art would assume that the converting of the address includes sending out the address with the type of transference and the converting of the data is sending out the data in different size blocks. Sending out the address with the type of transference is not address remapping. Kugue, therefore, does not teach,

disclose or suggest, an "address remapper remapping a dummy address from one station into a physical address to the other station" as is claimed in claim 1.

Even if the Examiner continues to assert that Kugue teaches bi-directional address translation, there is no motivation to combine the two references. As stated in MPEP 2143.01 states that "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.," citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Further, "obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art," MPEP 2143.01, citing *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Finally, "the showing [of obviousness] must be clear and particular," *In re Dembiczak*, 50 USPQ 2d 1614, 1616-1617 (Fed. Cir. 1999). The Applicant submits that disclosures of Blackledge and Kugue together with the knowledge generally available to one of ordinary skill in do not establish a *prima facie* case of obviousness.

As mentioned above, Kugue is directed toward a computer system being able to access a storage device after being hotly docked. Blackledge is directed toward address space architecture for multiple bus computer systems. There is no hint in either of these references to combine them as they are directed at completely different problems.

In addition, the Examiner asserts that Kugue discloses a bi-directional remapping function. The Examiner refers to the host-PCI bridge unit 12 of Kugue, which is connected between processor bus 1 and internal PCI bus 12. The Examiner asserts that it would have been obvious to combine the host-PCI bridge unit 12 of Kugue with the uni-directional address translation system of Blackledge to provide a bi-directional address translation system. However, the Examiner has not shown the "teaching, suggestion, or motivation" to make such a combination. Applicant wonders what problem would be solved by combining Kugue with Blackledge?

Kugue arguably teaches a bi-directional host-PCI bridge unit. Blackledge also has a host-PCI bridge 18 of Figure 1, however Blackledge only discusses address translation relative to a PCI-Microchannel bridge. Thus, replacing the host-PCI bridge of Blackledge with the host-PCI bridge of Kugue would not result in a bi-directional remapping system given the uni-directional mapping of the PCI-Microchannel Bridge. Further, one skilled in the art would not replace a PCI-Microchannel bridge with a host-PCI bridge as one would not work in place of the other. Clearly, there is no "teaching, suggestion, or motivation" in the references to combine the references in the manner done by the Examiner. The only such motivation seems to arise from the Applicant's specification, which may not be used to provide the teaching or suggestion to make the claimed invention.

Claims Rejections under 35 U.S.C. § 103 based on Blackledge and Garbus

Claim 1

Garbus teaches architecture for an I/O processor that integrates with a PCI to PCI Bridge. In the Office Action, the Examiner points to Garbus, col. 22, lines 37-58 for support that Garbus teaches a bi-directional address translator. Garbus discloses address translation units that support both inbound and outbound address translation. However, Garbus further teaches that the address translation units implement an address windowing scheme to determine which addresses to claim and translate to the appropriate bus, see col. 23, lines 12-15. Thus, the address translator of Garbus first determines if the address is directed toward a device connected to it's bus and then if the address is indeed a match, the bridge will translate the address. In contrast, the bridge of the present invention does not filter the address, instead claim 1 claims, "an address remapper remapping a dummy address from one section into a physical address to the other section". Thus, neither Blackledge nor Garbus teach, disclose or suggest "an address remapper remapping a dummy address from one section into a physical address to the other section", as claimed in claim 1. Thus, it is submitted that claim 1 is deemed patentable over the cited prior art.

Even if the Examiner continues to assert that Garbus teaches bi-directional address translation, there is no motivation to combine the two references. As stated in MPEP 2143.01 states that "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.," citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Further, "obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found wither in the references themselves or in the knowledge generally available to one of ordinary skill in the art," MPEP 2143.01, citing *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Finally, "the showing [of obviousness] must be clear and particular," *In re Dembiczak*, 50 USPQ 2d 1614, 1616-1617 (Fed. Cir. 1999). The Applicant submits that disclosures of Blackledge and Garbus together with the knowledge generally available to one of ordinary skill in do not establish a *prima facie* case of obviousness.

As mentioned above, Blackledge is directed toward address space architecture for multiple bus computer systems. Garbus is directed toward an architecture for an I/O processor that integrates a PCI to PCI Bridge. There is no hint in either of these references to combine them as they are directed at completely different problems.

In addition, the Examiner asserts that Garbus discloses a bi-directional remapping function. The Examiner refers to address translation unit 43 of Garbus, which is connected between processor local bus and primary or secondary PCI buses. The Examiner asserts that it would have been obvious to combine the address translation unit of Garbus with the uni-directional address translation system of Blackledge to provide a bi-directional address translation system. However, the Examiner has not shown the "teaching, suggestion, or motivation" to make such a combination. Applicant wonders what problem would be solved by combing Garbus with Blackledge?

Garbus arguably teaches a bi-directional address translation device which bridges between the local memory and the PCI busses. Blackledge does not show a bridge between the system memory 14 and the PCI bus 19. In addition, Blackledge only discusses address translation relative to a PCI-Microchannel bridge. Thus, placing a address translation bridge between the system memory and the PCI bus in Blackledge, according to the teachings of Garbus would not result in a bi-directional remapping system given the uni-directional mapping of the PCI-Microchannel Bridge. Further, one skilled in the art would not replace a PCI-Microchannel bridge with the bridge of Garbus as one would not work in place of the other. Clearly, there is no "teaching, suggestion, or motivation" in the references to combine the references in the manner done by the Examiner. The only such motivation seems to arise from the Applicant's specification, which may not be used to provide the teaching or suggestion to make the claimed invention.

For the reasons presented above, the Applicant submits that neither Blackledge, Kugue, nor Garbus, either alone or in combination, teach, disclose, or suggest each and every element of independent Claim 1.

Claims 2-8, 9-19

Independent Claims 4, 10, 13 and 16

The same arguments applied to claim 1 can also be applied to independent claims 4, 10, 13 and 16. Thus, claims 4, 10, 13 and 16 are deemed to be patentable over the Blackledge, Kuge, Garbus, and/or Kugue either alone or in combination.

New Independent Claim 18

Claim 18 claims, in part, "the address remapper transparently remapping each dummy address from one section into a physical address on the other section" (emphasis added).

Blackledge does not teach, disclose or suggest "the address remapper transparently remapping each dummy address from one section into a physical address on the other section" as is claimed in claim 18. For the reasons given above, Blackledge does not teach, disclose or suggest the address remapper remapping each dummy address from one section into a physical address on the other section. Further, the address translation in Blackledge is not transparent. Blackledge teaches in col. 5, lines 47-52 that the address comparator/range filter filters out addresses not corresponding to the subordinate devices. The translator then preforms the required translation. Thus, the address translation device of Blackledge is an address translator selectively translating address from one bus to an address on another bus, and not an "address remapper transparently remapping each dummy address from one section into a physical address on the other section" as is claimed in claim 18. Thus, it is submitted that claim 18 is patentable over Blackledge.

As stated above, Kugue does not undeniably teach bi-directional address translation. Given the ambiguity and sparseness of the teachings of Kugue, Kugue does not teach, disclose or suggest transparently remapping each dummy address as claimed in claim 18. Therefore, claim 18 is deemed to be patentable over Blackledge, Kugue and their combination.

Like Blackledge, Garbus teaches that the address translation units implement an address windowing scheme to determine which addresses to claim and translate to the appropriate bus, see col. 23, lines 12-15. Thus, the address translator of Garbus first determines if the address is directed toward a device connected to it's bus and then if the address is indeed a match, the bridge will translate the address. In contrast, the bridge of the present invention is does not filter the address, instead claim 18 claims, "address remapper transparently remapping each dummy address from one section into a physical address on the other section". There is no filtering based on addresses being done by the present invention, instead the address remapper transparently remapps each dummy address. Thus, Garbus does not teach, disclose or suggest "address remapper transparently remapping each dummy address from one section into a physical address on the other section", as claimed in claim 18. Thus, it is submitted that claim 18 is deemed patentable over the cited prior art.

Dependent Claims 2-3, 5-8, 11-12, 14-15, 17, and 19

Regarding Claims 2-3, 5-8, 11-12, 14-15, 17 and 19, the Examiner rejects these claims under 35 U.S.C. 103(a) as being made obvious by Blackledge in light of other references. However, these claims depend upon either Claims 1, 4, 10, 13, 16 or Claim 18. Therefore, the Applicant submits that these claims are patentable over Blackledge at least based upon their dependence on either Claims 1, 4, 10, 13, 16 or Claim 18.

Comments for Dependent Claims 2, 14 and 17

The Applicant further submits that Claims 2, 14 and 17 are not obvious based upon the additional features recited in these claims.

In the Official Action dated May 24, 2001, the Examiner asserts that Blackledge discloses that the address comprises a settable part and a fixed part wherein the fixed part can be changed from one type to the other, citing col. 8, lines 3-5 and col. 12, lines 5-28. Applicant respectfully submits that the Examiner has mischaracterized the teachings of Blackledge.

First, claim 2, claims in part, "wherein the format of a physical address comprises a fixed part and a settable part, and wherein the dummy address is obtained by changing at least one bit of the fixed part of the physical address". Addressing the first part of claim 2, "wherein the format of a physical address comprises a fixed part and a settable part". Neither of the sections cited by the Examiner in Blackledge teach that the physical address comprises a fixed part and a settable part. Thus, the Examiner has failed to show where in Blackledge this limitation is taught. Thus, claim 2 is deemed to be patentable over the Blackledge.

Addressing the second part of claim 2, "wherein the dummy address is obtained by changing at least one bit of the fixed part of the physical address". The sections of Blackledge cited by the Examiner refer to translating memory addresses to a different value. Col. 12, lines 5-28 of Blackledge specify why this is done. The address translation may be used to convert a 16 bit or 24 bit address to a 32 bit address, or to convert a 32 bit address to a 16 bit or 24 bit address.

This conversion may be done by an adder, exclusive OR or stripping. None of these three methods of address conversion allow for a "a dummy address is obtained by changing at least one bit of the fixed part of the physical address". They all require changing of many bits, and in the case of stripping actually removing some of the bits. Thus, Applicant submits that Blackledge does not teach, disclose or suggest all of the claim limitations found in claim 2.

Further, the Examiner has not pointed out where in Kugue or Garbus these limitations may be found. Specifically, in relation to Kugue and Garbus, the address translator is connected to a CPU. Applicant is unaware of how the physical address space of the CPU may comprise of a fixed part and a setable part. Further, Applicant is unaware of where in either Kugue or Garbus, changing at least one bit of the fixed part of the physical address of a CPU would allow for the address translation onto the PCI bus. Thus, the Applicant submits that claim 2 is patentable over Blackledge, Kugue and/or Garbus either alone or in combination.

In addition, the same arguments presented above in support of the patentability of claim 2 can be applied to claims 14 and 19. Thus, Applicant submits that claims 14 and 19 are also patentable over Blackledge, Kugue and their combination.

Comments for Dependent Claim 5

The Applicant further submits that Claim 5 is not obvious based upon the additional features recited in these claims.

In the Official Action, the Examiner asserts that Blackledge does not explicitly disclose that the bus is a two wire serial bus having one data wire and one clock wire. However, the Examiner asserts that the use of two wire serial bus is well-known in the art for connecting a number of stations. Therefore, it would have been an obvious matter of art to use an equivalent two wire serial bus instead of the parallel bus. The Applicant respectfully disagrees with the Examiner's position.

Applicant asks the Examiner to provide art in which a parallel PCI bus is replaced with a two-wire serial bus in order to perform the same function. Given that Blackledge, along with Kugue and Garbus, disclose PCI buses. PCI buses are parallel busses. The architectures of Blackledge, Garbus and Kugue rely on parallel busses. In fact the translation apparatus of Blackledge, described in col. 6, lines 17-45 relies on the fact that the address is coming in on parallel lines. There is a n-bit wide register contained within the address filter register. While parallel busses and serial busses are known in the art, they are not considered to be equivalents in all situations. A parallel bus has the capability of sending many bits at one time. However with a serial bus, only one bit at a time can be sent. Thus, in one clock cycle on a parallel bus, an address translation unit will receive all of the bits of a given address. However, with a serial bus, this is not the case. It would take many clock cycles for the address bits to be received. Given at least this one difference, there are also timing considerations that are involved in using a serial bus instead of a parallel bus. Neither Blackledge, Garbus nor Kugue address any of these considerations. In fact, there is no hint or suggestion in either Blackledge, Garbus or Kugue that the parallel busses could be replaced with serial busses. Thus, neither Blackledge, Garbus or Kugue, either alone or in combination, teach, disclose or suggest "wherein the bus is a two wire serial bus" as is claimed in claim 5. Thus claim 5 is deemed to be patentable over the art cited by the Examiner.

Conclusion

The Applicant asserts that Claims 1-8, 10-19 are patentable for the reasons set forth above. Therefore, the application, then, is properly allowable over the prior art which has been cited. It is respectfully requested that a Notice of Allowance be issued.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account 12-0145.

I hereby certify that this correspondence is being deposited with the United States Post Office with sufficient postage as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington D.C. 20231 on


July 25, 2002
(Date of Deposit)

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Respectfully submitted,



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